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BRIEF REPORT

Potential Utility of Sentinel Node Biopsy in the Original Surgical Assessment of Hürthle Cell Tumors of the Thyroid: 23-Year Institutional Review of Hürthle Cell Neoplasms

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Background and Objectives: Great difficulty still exists in determining the potential malignancy of Hürthle cell tumors of the thyroid gland. Indications for the extent of resection vary greatly in the reported literature. Sentinel node biopsy has shown its usefulness as a prognostic indicator in both melanoma and breast cancer. The feasibility of using it as an integral part of Hürthle cell tumor surgery was investigated and is discussed.
Methods: Eleven patients diagnosed with Hürthle cell tumors between the years of 1975 and 1998 were reviewed. The last three patients had sentinel node biopsy with isosulfan blue dye as an integral part of their procedure.
Results: Sentinel node biopsy was accomplished without difficulty or complication in our last three patients. Two patients were considered to be benign by frozen section and final pathology. Their sentinel nodes were benign. One patient was considered malignant on both frozen and final pathology. His sentinel nodes as well as central node dissection revealed no lymphatic spread.
Conclusions: Malignancy of Hürthle cell tumors of the thyroid is difficult to determine even on final pathological examination. The addition of nodal sampling may add valuable prognostic information. Sentinel node biopsy with isosulfan blue dye, although not previously reported for these tumors, appears to be a logical next step in the evolution of surgical management. *J. Surg. Oncol. 1999;70:100–102.*

KEY WORDS: **Hürthle cell tumor; benign vs. malignant; appropriate resection; sentinel node biopsy**

INTRODUCTION

Controversy concerning Hürthle cell tumors should not be construed as being confined to the last quarter of the 20th century. Ewing [1], in his book Neoplastic Diseases, first mentioned the term ''Hürthle cell'' in his description of interfollicular cells described by Hürthle in normal canine thyroid glands. Willis [1a] later proposed that the original tumor described by Ewing was from an en-

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tirely different cell type described by Askanazy [2] 50 years earlier and that Langhans [3] may have described it 20 years earlier than Ewing [1]. Hürthle cell is by now hopelessly entrenched in the literature but is certainly a misnomer.

Questions persist in the diagnosis and treatment of Hürthle cell tumors of the thyroid. Of most import is the great difficulty in determining benign vs. malignant lesions. In 1907, Langhans [3] described five patients with Hürthle cell tumors in which there was no evidence of cancer histologically but who later died of the disease. Most pathologists use LiVolsi's [4,5] original criteria for malignant assessment which requires capsular or vascular invasion in a solitary encapsulated nodule. Numerous examples in both the pathologic and surgical literature have shown that determination based on these criteria, although helpful, is not entirely reliable.

MATERIALS AND METHODS

During the years 1975–1998, 11 patients were diagnosed with Hürthle cell neoplasms by staff from Louisiana State University at Monroe. Three were considered to be malignant based upon some or all of the following characteristics: complete capsular invasion, vascular invasion, cellular pleomorphism, and atypia. Lesions considered benign were completely encapsulated with uniform cellular characteristics and few mitoses. Conditions characterized by nodular groups of Hürthle cells, especially as seen in Hashimoto thyroiditis, were not considered to be of neoplastic origin.

Eight patients, from 1986 to the present, had fine-needle aspirate performed preoperatively. Six of the eight had a preoperative diagnosis of probable Hürthle cell neoplasm by fine-needle aspirate. Two were considered inconclusive for diagnosis. Three patients from 1996 to the present had sentinel node sampling performed with isosulfan blue dye. All three of these had a fine-needle aspirate showing probable Hürthle cell neoplasm preoperatively. Isosulfan blue was injected directly into the tumors or portions of the lobe affected by tumor after the thyroid was exposed. Great care was taken to minimize dissection or disruption of lymphatics until 20 min after injection of dye. The subsequent surgical resection was in no way impeded by the injection. Parathyroid glands and recurrent laryngeal nerves were easily identified. Of the last three patients, one had a malignant tumor and two were adenomas by histological criteria.

RESULTS

Nodal sampling was easily performed without complication and included paratracheal and jugular nodes. The patient with a malignant tumor had a central neck dissection along with sentinel node mapping. All nodes were reported as negative for metastatic disease. Two deaths attributed to metastatic Hürthle cell carcinoma have occurred in the total of 11 patients: one in a patient considered to be malignant by histologic criteria and one in a patient considered benign. The patient who was considered to be malignant had both capsular and vascular invasion as well as direct extension into perithyroidal tissues. Central node dissection showed no positive nodes. The patient considered to be benign had no vascular or capsular invasion and no extension or palpable nodes. Both patients were males older than 50 years at the time of discovery and original surgery. Lymph node recurrence in the neck was a part of their overall metastatic recurrence and death. These deaths occurred before 1985. Neither fine-needle aspiration nor sentinel node sampling was done in either of these patients. The death of a patient with a seemingly benign lesion prompted this evaluation and addition of sentinel node sampling as an integral part of our Hürthle cell tumor surgery.

DISCUSSION

During the last 20 years, suggested methods of management of Hürthle cell tumors have varied from nodulectomy or lobectomy to total thyroidectomy. Reasons for this divergence of opinion include the obvious increased morbidity of total thyroidectomy as opposed to possible increase in recurrence or mortality when performing a lesser procedure [6].

Thompson et al. [7–9] suggest that after a fine-needle aspirate showing Hürthle cells in most of the specimen a lobectomy and isthmusectomy should be the least extensive procedure performed. If a true Hürthle cell neoplasm is found, then multiple frozen sections are taken and evaluated for vascular or capsular invasion. If these sections are interpreted as benign, then the procedure is terminated. If permanent sections show malignancy, an expeditious completion thyroidectomy is performed.

Exceptions that could possibly necessitate a total thyroidectomy as a primary procedure are previous history of radiation to the head and neck; palpable nodules in the opposite lobe; tumors more than 5 cm in diameter; and aneuploid tumors.

Many surgical groups have concluded that a total thyroidectomy is too morbid a procedure for these lesions and reserve this for only the obvious carcinomas [10].

Nodal metastases from Hürthle cell tumors have been noted as a major indicator of mortality and morbidity in virtually all the recorded series. Rosi and Carcangiu [6] reported 153 cases of Hürthle cell tumors with metastases developing in 18. Nodal recurrences show a somewhat indolent course and appear on an average of 5–6 years after original surgery [6].

The significance of nodal metastasis in differentiated thyroid neoplasms has been a source of debate for decades. Hürthle cell tumors with positive nodes show mortality rates as high as 18–30%. Watson et al. [11] concluded that the presence or absence of nodal involvement

was quite important in the difference in rates of local recurrence, metastatic disease, or death ($P < 0.01$ between the two subgroups).

Morton [12] suggest that sentinel node biopsy may be predictive for nodal metastases in melanoma and allow for identifying the appropriate subset of patients for radical node dissection. It has now been expanded to the treatment of breast cancer. Sentinel node biopsy in evaluating thyroid lesions has been described within the last few years [13]. Any other modality including immunochemical studies, DNA studies, or nodal status would be a welcome addition in the assessment of Hürthle cell tumors. Morbidity of parathyroidal or jugular lymph node sampling with sentinel node biopsy is low. The addition of nodal tissue immediately draining a Hürthle cell tumor may give prognostic indications.

Sentinel node biopsy with blue dye or isotope makes the identification of the proper node or nodes much easier in the mid-compartment of the neck as well as the upper mediastinum and jugular chain. Hamming et al. [14] demonstrated that recurrent laryngeal nerve and parathyroid injuries were greater in patients undergoing central neck dissection as opposed to those who only had suspicious nodes removed. Kelemen et al. [13] showed that routine paratracheal node dissection or blind jugular sampling is apt to miss metastatic lymph nodes.

The significance of a positive node is obvious and could change the treatment plan tremendously in both scope and timing. The possibility of decreasing morbidity or mortality by including completion thyroidectomy and lymphadenectomy prior to clinical adenopathy or opposite lobe recurrence should be considered. The prompt addition of adjuvant therapy with radioactive iodine could also be of significant clinical importance.

CONCLUSIONS

We present a total of 11 cases of Hürthle cell tumors treated within the last 23 years. The last three cases have had intraoperative sentinel node sampling with isosulfan blue dye. Due to the inability to determine malignancy in a Hürthle cell tumor with certainty, all Hürthle cell tumors should be considered for sentinel node sampling as an integral part of their original surgical procedure.

REFERENCES

1. Ewing J: Tumors of the thyroid. In: ''Neoplastic Diseases.'' 1st Ed. Philadelphia: W.B. Saunders, 1928:942–965.

1a. Willis RA: Epithelial tumors of the thyroid gland. In: "Pathology of Tumors." St. Louis, MO: C.V. Mosby, 1948:601–623.

2. Askanazy M: Pathologisch-Anatomische Beitrage zur Kenntnis des Morbus Basedowii, Insbesondere Uber die Dabei Auftretende Muskelerkrankung. Dtsch Arch Klin Med 1898;61:118–186.

3. Langhans T: Uber die Epithelialen Formen der Malignen Struma. Virchows Arch A 1907;89:69–152.

4. LiVolsi VA: Pathology of tyroid cancer. In Greenfield LP (ed): ''Thyroid Cancer.'' Boca Raton, FL: CRC Press, 1978:101–111.

5. LiVolsi VA: ''Surgical Pathology of the Thyroid.'' Philadelphia: W.B. Saunders, 1990:188–193.

6. Rosi J, Carcangiu ML: Pathology of thyroid tumors: Some recent and old questions. Hum Pathol 1984;15:1008–1012.

7. Gundry SR, Burney RE, Thompson NW: Total thyroidectomy for Hürthle cell neoplasm of the thyroid. Arch Surg 1983;118:529–532.

8. McLeod MK, Thompson NW, Hudson JL: Flow cytometric measurements of nuclear DNA and ploidy analysis in Hürthle cell neoplasms of the thyroid. Arch Surg 1988;123:849–856.

9. Thompson NW, Dunn EL, Batsakis JG, et al.: Hürthle cell lesions of the thyroid gland. Surg Gynecol Obstet 1974;139:555–560.

10. Caplan RH, Abellera M, Kisken WA: Hürthle cell tumors of the thyroid gland. JAMA 1984;251:3114–3117.

11. Watson R, Brennan MD, Goellner JR, et al.: Invasive Hürthle cell carcinoma of the thyroid. Mayo Clin Proc 1984;59:851–855.

12. Morton DL, Wen DR, Cochran A: Management of early-stage melanoma by intraoperative lymphatic mapping and selective lymphadenectomy: An alternative to routine elective lymphadenectomy or ''watch and wait.'' Surg Oncol Clin North 1992;1:247–259.

13. Kelemen R, Van Herle AJ, Giuliano AE: Sentinel lymphadenectomy in thyroid malignant neoplasms. Arch Surg 1998;133:288–292.

14. Hamming JF, Van De Velde CJH, Fleuren GJ, et al.: Differentiated thyroid cancer: A stage-adapted approach to the treatment of regional lymph node metastasis. Eur J Cancer Clin Oncol 1988;24:325–330.